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(74) Agent: **KRATOCHVÍL, Václav**; Sachta, Zmeskal &
part., Radlická 28/663, 150 00 Praha 5 - Smíchov (CZ).

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(71) Applicants (*for all designated States except US*): **ATME
S.R.O.** [CZ/CZ]; Pod Stromovkou 205, 370 01 České
Budějovice (CZ). **COMINFO, A.S.** [CZ/CZ]; Za Humny
488, 76314 Zlín (CZ).

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(72) Inventors; and

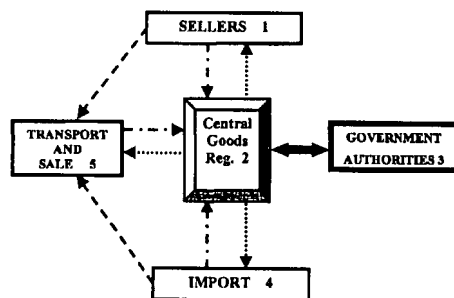
(75) Inventors/Applicants (*for US only*): **VOJTÍCH, Lukáš**?
[CZ/CZ]; Nahořanská 307, 549 01 Nové Město nad Metují
(CZ). **FIALA, František** [CZ/CZ]; Novohradská 346, 382
41 Kaplice (CZ).

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(54) Title: METHOD OF REGISTERING AND/OR PROTECTING GOODS AND AN IMPLEMENTATION SYSTEM FOR THIS METHOD



EXPLANATORY NOTES:

GOODS ROUTE
GOODS INFORMATION
INFORMATION VERIFICATION AND ASSESSMENT
MARKETING INFORMATION (according to access rights)

WO 2004/042624 A1

(57) Abstract: Method of registering and/or protecting goods and a system for implementing this method. This invention concerns the method or registering and/or protecting goods, where the goods are provided with an information storage medium with contactless data transmission (CIM) which is unique, and the data stored in it are secured by the method of asymmetrical encryption using the least one pair of keys always comprising a private and a public key. When using this method, at least one unique number and/or goods data is entered into the CIM and, using at least one private key, a cryptogram is created from the unique CIM number, which is then saved in the CIM memory. The authenticity of the CIM is verified by deciphering the cryptogram saved in the CIM using the public key. The goods information is entered into the CIM by a relevant government authority and/or the seller, and the unique number information, the type and quantity of the goods are entered into the goods database and/or the central goods database (CGD).



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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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Method of registering and/or protecting goods and an implementation system for this method.

5

Technical field

The invention concerns registering and/or protecting goods and an implementation system for this method.

10

Background of the invention

There are many methods used to register goods, but these are designed mainly for retailers, particularly for larger shops and retail chains, where goods registration allows the better control of stock and speeds up the sales of goods. In most cases, the goods are equipped with a scannable code, such as the barcode.

20

The main disadvantage of this system is that it is suitable for only one group in the chain - manufacturer, carrier, wholesaler and retailer. To be more specific, either the wholesaler or the retailer.

25

Holographs or paper labels, for instance, are also used to protect the origin of goods.

Standard holographic protection is relatively simple to forge, and verifying the authenticity of holographs requires expert analysis.

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As far as the standard and commonly used protection method by means of paper labels is concerned, the advantage of this method is its simple applicability to the product, its low price and protection against forging or copying by methods used in printing paper labels. However, as it is necessary to fit within a relatively small area several protection elements against copying, and because the label can be produced by easily accessible methods, goods labelling cannot be regarded as a complete guarantee of the product's authenticity.

Summary of the invention

The shortcomings of the currently used methods mentioned above can be eliminated to a large degree by using the method of registering and/or protecting goods which are the subject of this invention. The principle of this invention is to attach to the product a data storage medium with contactless data transmission (CIM) which is unique, and secures the data stored in it by asymmetric encryption using at least one pair of keys, one private and one public. When using this method, at least one unique number and/or goods information data is saved in the CIM memory, and using at least one private key, a cryptogram is created from this unique CIM number and/or goods information data. The cryptogram is then saved in the CIM. The goods authenticity is checked by deciphering the cryptogram saved in the CIM, using the public key. The goods information data is saved in the CIM by a government authority and/or the vendor, and information on the unique CIM number and/or the goods information data is stored in a goods database. The vendor is understood to be the goods

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manufacturer, importer or distributor who puts the goods into circulation.

In a convenient version, the CIM will be equipped with
5 a function allowing the simultaneous reading of multiple
CIMs in the same space and at the same time. The goods
information data contained in the CIM can be saved in a
central goods database (CGD). The relevant government
authorities and/or the parties involved will have access to
10 the CGD, with limited access rights to the information
saved in the CGD, and any retailer will be able to verify
the authenticity of the CIM, even without access rights to
the CGD. When the goods are resold, information from each
seller is again entered into the CGD, by which the
15 correctness of the original information entered by the
seller is verified. Data on imported goods can also be
entered into the CGD, and the data can be compared to the
verified customs data.

20 The invention also includes a system for implementing
the method described above. The system comprises goods
completion equipment with a data storage medium and
contactless data transmission (CIM) which is unique, and
the data stored in it are secured by asymmetric encryption
25 using at least one pair of keys, one private and one
public. When using this method, at least one unique number
and/or goods information data is saved in the CIM memory,
and a cryptogram is created from this unique CIM number
and/or goods information data using at least one private
30 key. The cryptogram is then saved in the CIM. The goods
authenticity is checked by deciphering the cryptogram saved
in the CIM, using the public key. The goods information
data are saved in the CIM by the relevant government

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authority and/or the vendor. The equipment is connected to a database containing at least the unique number and the type and quantity of the goods.

5 In a convenient version, the CIM can be equipped with a reader allowing the simultaneous reading of multiple CIMs in the same space and at the same time. The seller's equipment can be connected to the central goods database (CGD). The CGD is linked with at least one government
10 authority and/or at least one party involved, with limited access rights to the information saved in the CGD. When the goods are resold, information from each seller is again entered into the CGD, by which the correctness of the information originally entered by the seller is verified.
15 The goods authenticity can be verified by any seller, even one who has no access to the CGD. The CGD can be optionally connected to the database of imported goods and/or a virtual goods warehouse.

20 Thus, CIM is an information storage medium that allows the data stored to be transmitted in a contactless manner. In this manner, information can be transmitted between the CIM and a reader without the need for direct contact between the CIM and the reading device. CIMs can also be
25 glued between self-adhesive layers, creating self-adhesive labels with optional print. Alternatively, they can be inserted and laminated between plastic foils, or be inserted inside or outside products and can be provided with additional identification - for example a barcode, or
30 print. One special feature is a function that will allow the simultaneous reading of more CIMs in the same space and at the same time. Other specific data can be saved in the CIM, which will be used to create a cryptogram.

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In a convenient version, a government authority or another body nominated by this authority can reserve part of the CIM storage capacity for the seller's needs. The relevant government authority will establish a special CGD for the purpose of collecting information thus obtained. The encoded goods information data stored in the CIM will be transmitted via data transmission routes to the CGD. Only legally authorised supervisory institutions such as business inspectors, tax offices, special audit offices, the police, customs offices, courts, etc. will have access to the CGD.

Information from the goods sellers in the particular country at the point of first sale or delivery to the warehouse or to the sales network by, for instance, carriers or clients, is entered into the CGD on a priority basis. Goods information from the goods importers when importing the goods to a particular country or before the goods are released to free circulation in accordance with customs regulations is also entered into the CGD on a priority basis.

Another convenient version is to transmit the data on imported goods and data from the CGD to a virtual goods warehouse managed by a government authority. In this option, the imported goods data are compared to the verified customs data.

The invention also includes a system comprising a device located at the seller's premises, which will equip the goods with CIMs before they are shipped. The seller's equipment can also be connected to readers and registers of

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CIM data contents located at any client's premises. The client equipment will be connected to the CGD, where the encoded information will be sent every time the goods are resold to another client. Information feedback between the seller's equipment and the central database can be precisely defined. Data from this feedback can be used not only for the marketing purposes of each of the parties involved, but also as input materials for automatic accounting operations. This will eliminate the most difficult phase of automatic accounting systems, which is data collection.

In a convenient version, the equipment registering the CIM goods information data contents installed at the seller and clients in the sales chain will be connected to the CGD. At least one of the following institutions will also be connected to the CGD: business inspector, revenue receiver, police, customs office, courts, etc. The CGD will be conveniently connected to the imported goods database and/or the virtual goods warehouse.

During the registration process, the goods will be conveniently provided with known, commonly used CIM procedures containing the unique number, the goods information and the cryptogram. Information thus encoded will then be entered into the central goods database which will also be made accessible to clients. This will allow the goods to be easily identified; all the buyer has to do is to obtain the relevant goods information data from the seller and simply enter the goods identification into its internal database. Provided that the information on the quantity of the purchased goods is entered into the central goods database and into the buyer's databases during the

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purchase transaction and, after the goods have been resold to other buyers, the data on the sold goods are again entered into the central goods database, it will be possible to check the goods authenticity with both the
5 seller and the buyer. As the CIM can be read in a contactless manner, the goods can also be checked by the goods carrier, the dealer's intermediary and by all other parties to the business transactions, right down to the final seller. This goods identification system will prevent
10 illegal and counterfeit goods from being distributed, and simplify the process of checking goods with all parties to the business transactions.

Provided that the relevant government authority
15 allocates at least part of the CIM memory capacity to sellers, government authorities too will acquire control over the goods flow and thus will be able to eliminate counterfeits from our market and at the same time make the auditing for such institutions as the National Business
20 Inspectorate, the Revenue Receiver, the Audit Office, the Police, the Customs Office, courts, etc., easier.

If data on imported goods are also entered into the CGD, illegally imported goods can tracked, such as alcohol,
25 cigarettes, electronics, etc. For easier orientation in the large quantity of goods, it will be advantageous to transfer the data from the CGD to the virtual goods warehouse. If the imported goods data are compared to the verified customs office data, the distribution of imported
30 counterfeits and undesirable goods can be prevented and the economy of the given country effectively protected.

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The system for implementing the method described above can be utilised by the seller's existing equipment used to mark goods with various codes, such as the barcode. The devices can communicate with each other using existing telecommunications networks. CIMs can be produced easily using available technologies; their price should not differ significantly from the prices of barcode labels. Contactless reading speeds the handling process during goods manipulation or, for instance, when the goods are being sold to clients, as there is no need to first locate the goods code and only then read it with the reader. Because the seller's equipment is connected to the CGD and the buyer's devices for reading and registering the CIM data contents, all the buyers have to do is to obtain from the sellers the relevant part of the goods data, and then they can immediately distribute the goods further. Having the buyer's devices connected to the CGD will allow a retroactive check of goods purchased and sold. If the seller's equipment is connected to the CGD with a retroactive effect, the seller can check at any time whether counterfeits of their goods have entered the market. This can prevent significant financial losses from being incurred by the sellers, particularly by the manufacturers of designer goods, cigarettes, alcohol, etc.

25

Among the major benefits of this system is its financial affordability, as CIM and registration and reading devices can be bought at prices comparable to, for example, barcode technology. Another important benefit is the return on investment, as the system to a large degree eliminates trading in illegal goods, uncontrolled movement of material, stock or equipment which the system uses; the actual breakeven point will always depend on the specific

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application and the degree of utilisation. Another advantage of this system is the ecological harmlessness of this technology due to the use of materials which are either recyclable or which can be liquidated without imposing an ecological burden on the environment. CIMs can be manufactured in a number of shapes so that they do not interfere with the aesthetic appearance of the product or its packaging. The CIM's long life is determined by its resistance against temperatures ranging from -50°C to +70°C and their high resistance against both acidic and alkaline environments and 100% humidity. One fundamental benefit is their uniqueness and unmatched data capacity, reflecting the know-how and uniqueness of their technical design. The system is applicable within a broad spectrum of human activities, from the protection and registration of goods to sophisticated systems of registering persons, property, goods in stock and special equipment of importance in national security and defence. It can also be used to strengthen the protection of the economic interests of goods manufacturers and distributors and the protection of business and institutional property. In addition, it will find a use in the protection of national economic interests, particularly in the area of increasing tax collection yields, eliminating illegal trade and connected criminal activities, it can be used in building an automated taxation system, in reducing tax collection costs, increasing the tax collection system's effectiveness without imposing a significant cost burden on the government budget, and for the protection of national interests when registering special equipment for the needs of national security and defence. Furthermore, the system can be used to the advantage of the internal needs of businesses, banks and other institutions. The system

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introduces a strong preventative aspect, particularly in the area of the struggle against organised crime, including on an international scale, especially in the area of property crime and in the area of tax and customs evasion.

5 Another benefit is the significant social and political aspect of the system which, by its character, excludes the negative impact of the human factor in the sensitive area of goods circulation and tax and customs affairs. By eliminating the human factor, it significantly narrows the

10 scope for corruption and information leaks which can be misused for unfair competition in the market environment, strengthens the pressure on ethical conduct and honesty in business, manufacturing and goods distribution, protects consumers from forgeries and poor-quality goods which might

15 endanger their health and safety, favours businesses which operate within the legal economy before the growing grey or black economy connected with the globalisation of world markets.

20 One advantage of this solution also lies in its ability to be applied on a global scale, particularly in the area of trade with sensitive commodities and consumer goods, where it can lead to a significant reduction of sources of illegal and organised crime on an international

25 scale, and effectively act against the development of international terrorism by reducing the financial resources which come from these criminal activities.

30 Brief description of drawings

The invention will be described in detail with a specific example using the enclosed drawing, which shows a

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schematic diagram of possible connections of the goods registration system.

5 Detailed description of the preferred embodiments

Example 1

The first example illustrates how the system can be
10 used in goods manufacture by a domestic producer for
domestic consumption. The seller, in this case the goods
manufacturer, purchases CIMs from a relevant government
authority 3, with a predefined data content section.
Information concerning the sale of the given quantity of
15 CIMs to the specific manufacturer is entered into the CGD
2. During the production process before the goods are
shipped, the manufacturer, using internal equipment 1,
provides the goods in the required extent, i.e. individual
products, whole packaging, etc., with CIMs containing data
20 as determined by the relevant government authority 3, plus
goods information data entered by the manufacturer in the
chosen extent. The CIM data thus created are locked using a
special key which will protect the contents against outside
interference. When the goods are shipped, the information
25 stored in each CIM is read by a reader and transmitted to
the manufacturer's internal database, i.e. to the
manufacturer's information or stock control and accounting
system, and at the same time to the CGD 2 administered by
an appointed government authority. When taking the goods
30 into stock, the goods buyer 5 uses the information saved in
the CIM for entering the goods into the internal stock
control and accounts systems using an internal reader, in
the process of which the information can again be

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transmitted to the CGD 2. When selling the goods to another buyer 5 or consumer, information about the sale must be passed to the CGD 2 via the CIM data reader. If the ultimate user in the trade chain is the end consumer, this
5 information is the last check data written to the CGD 2.

The goods authenticity and origin can be checked at any point during the goods movements or storage, using a portable detection system of any manufacturer or government
10 audit institution, in compliance with applicable legislation.

Example 2

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This example shows use of the system when importing goods to a country for domestic consumption. In this case, the importer or the foreign manufacturer buys CIMs from the relevant government authority of the importing country.
20 Information about the sale of the given quantity of specific CIMs to a specific manufacturer is again saved in the CGD 2 and in the imported goods database 4. The foreign manufacturer or the importer marks the imported goods with CIMs, i.e. provides the goods with CIMs. Then the foreign
25 manufacturer or importer supplements the CIM information with its own goods information data and locks the CIM data file using a special key. During the goods import, it will be possible for any customs office, whether at the border crossing or inland, to check the goods declared in the
30 customs documents using detection equipment, and at the same time the information will be transmitted to the CGD 2 and confronted with the information about the sale to the importer or manufacturer independently of the customs

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document data. At the same time, the information can be checked against the data in the customs documents and in the CIM without the customs officer's intervention. The goods are then released into free circulation and their
5 buyer 5, after having received the goods in the warehouse, can transmit the CIM data to its stock control and accounts systems using an internal reader, in the process of which the information is again transmitted to the CGD 2. When reselling the goods to another buyer 5 or consumer, the
10 sales information is again recorded in the CGD 2 using a reader of the CIM data content. If the ultimate user in the trade chain is the end consumer, this information is the last check information written to the CGD 2. The goods authenticity and origin can be checked at any point during
15 the goods movement or storage using a portable detection system belonging to any manufacturer or a government audit institution in compliance with applicable legislation.

The coded information contained in CIM can be
20 transmitted or checked using either fixed or portable reading equipment with a varying maximum distance of detection depending on the conditions and requirements, limited by the CIM's technical ability and state of development.

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The CGD 2 will be used in particular by the relevant government authorities for checking and registration and for tax, statistical and other purposes in compliance with the applicable legislation.

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The encoded information in the CIM does not preclude the use of a manufacturer's internal protection system and

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auditing or other information or statistical systems,
systems for recording quantities, types on demand, etc.

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Industry utilisation

The invention will find a use especially for
registering goods by manufacturers, vendors, carriers and
10 sellers, and for checking purposes by government
supervisory authorities.

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PATENT CLAIMS

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1. The goods registration and protection method *is characterised by* providing the goods with a contactless data transmission information storage medium (CIM) which is unique, and the data saved in it are secured by means of an asymmetric encryption method using at least one pair of keys which always contains a private key and a public key, where at least one unique number and/or goods data is saved in the CIM memory and where, using at least one private key, a cryptogram is created from the unique number and/or goods data, which is then saved in the CIM; the CIM's authenticity is verified by deciphering the cryptogram saved in the CIM using the public key, with the goods information stored in the CIM by the relevant government authority and/or the manufacturer, and the unique CIM number and/or goods data entered into the goods database.

2. The method described in 1 above *is characterised by* the CIM being equipped with a function which will allow more CIMs to be read simultaneously within the same space and at the same time.

3. The method described in 1 and 2 above *is characterised by* the information on the unique CIM number and the goods saved in the CIM being entered into the central goods database (CGD).

4. The method described in 3 above *is characterised by* limited access to the CGD by the relevant government

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authorities and/or participating entities, whereby the CIM's authenticity can be verified by any seller even without having access to the CGD.

5 5. The method described in 3 and 4 above *is characterised by* information from each seller being entered again in the CGD when the goods are resold, which means that the correctness of the original information inserted by the seller is subsequently verified.

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6. The methods described above *are characterised by* imported goods data also being entered into the CGD.

7. The method described in 6 *is characterised by* the goods
15 data being verified against customs data.

8. The system of implementing any of the above-stated methods is *characterised by* comprisal of the seller's goods completion equipment (1) with a unique contactless data
20 transmission information medium (CIM), with the data saved in it secured by an asymmetrical encryption method using at least one pair of keys always comprising a private and a public key, where at least one unique number and/or goods data is saved in the CIM memory, and where a cryptogram is
25 created from this unique number and/or goods data using at least one private key and saved in the CIM memory, and where the goods information data are entered into the CIM by the relevant government authority (3) and/or the seller, and where the equipment is connected to the goods database.

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9. The system described in 8 above *is characterised by* a CIM equipped with a reader capable of reading multiple CIMs simultaneously within the same space and at the same time.

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10. The system described in 8 and 9 above *is characterised by* the seller's equipment (1) being interconnected with the central goods database (CGD) (2).

5

11. The system described in 10 above *is characterised by* the CGD (2) being connected to at least one government institution (3) and/or at least one participating entity with limited access rights to the information stored in the
10 CGD, and where the CIM authenticity can be verified using any seller's equipment (1), even with no access to the CGD (2).

12. The system described in 8 through 10 above *is*
15 *characterised by* the CGD being connected to a database of imported goods (4) and/or virtual goods warehouse.

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connected to a database of the type and quantity of the
goods. The seller's equipment (1) is connected to at least
one government institution (3) and/or at least one
participating entity with defined access rights to the
5 information stored in the CGD (2), where the authenticity
of the CIM can be verified by equipment (1) installed at
any seller, even without access rights to the CGD (2).

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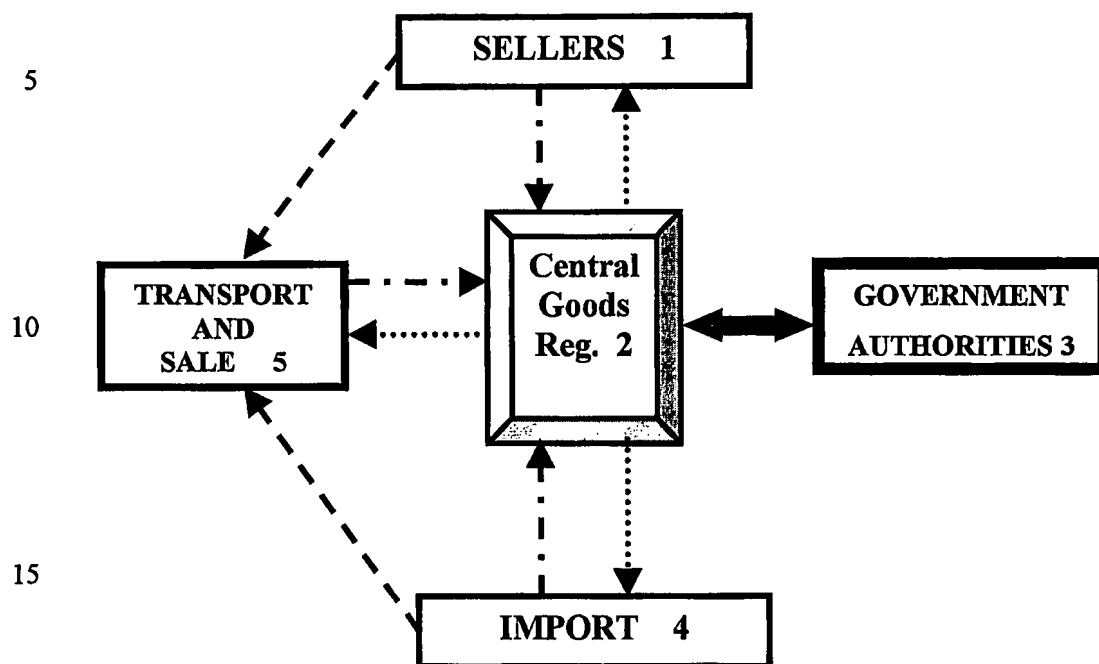


FIG. 1

EXPLANATORY NOTES:

GOODS ROUTE

GOODS INFORMATION

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30 INFORMATION VERIFICATION AND ASSESSMENT

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MARKETING INFORMATION (according to access rights)

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/CZ 03/00032

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06F17/60 G06K19/07 G06K19/077

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G06F G06K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	WO 02 35432 A (PROMEGA CORP) 2 May 2002 (2002-05-02) abstract page 2, line 1 -page 4, line 7 -/--	1-12

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel: (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

van der Weiden, A

INTERNATIONAL SEARCH REPORT

International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT
 information on patent family members

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